

EECA & Sustainable Business Council

LEFC – Project Summary

Final Report – For Publication

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Framework Group



Steering Group



Contributing Specialists



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Executive Summary

This report details the findings of the detailed feasibility into the Low Emissions Freight Certificate (LEFC) project. The system would allow certificates to be generated by low carbon freight assets, which can then be sold to freight users, aiming to speed up the decarbonisation of the heavy road freight sector in New Zealand.

The system would be a Book and Claim system which is designed to separate physical attributes and environmental attributes of a product and then applying the environmental attributes to organisations who value them. The two key outcomes of the system are:

- Revenue generated through the sale of the certificates would be used to help fund additional low carbon freight assets for freight providers.
- Certificate purchasers can reduce their gross Scope 3 freight carbon emissions via a market-based accounting approach.

The rules of the system are based on a range of methodologies and frameworks (such as those by the Smart Freight Centre) to adhere to best practice and international carbon accounting processes and standards, such as those outlined by the Greenhouse Gas Protocol.

There are several key requirements of the LEFC system, determined through the various stages of this study in conjunction with literature review, input from the framework group and discussions with other, expert parties. These requirements include, but are not limited to:

- Participant requirements and compliance.
- Vehicle/fuel types.
- Calculation methodologies.
- Constraints and mechanisms to prevent double counting.
- Constraints and mechanisms to ensure additionality.

Compliance with the requirements is essential to provide a functional system and to alleviate any perception of greenwashing that may occur through the operation of a Book and Claim system.

This report also summarises the findings from a separate demand study, which was undertaken to gauge interest from various organisations that may wish to participate in the system. It was found that:

- There is significant interest for decarbonisation in the freight space, with growing customer desire for low carbon deliveries.
- The majority of organisations spoken to are supportive of such a system, but a lesser number would be willing to pay for certificates. Those that are willing to pay would likely contribute ~\$100/tCO₂e.
- The Total Cost of Ownership of various low carbon transport options outlined that certificate pricing of \$200/tCO₂e - \$600/tCO₂e would be required to offset the marginal cost of key technologies, although these values vary greatly depending on inputs and operational characteristics.

- The gap between what purchasers are willing to pay, and what generators need to be paid, could be somewhat overcome by the multiple valid beneficiaries (at different points of the supply chain) of the certificate all paying a portion.
- Greenwashing is a concern, and having organisations such as SBTi endorsing similar methodologies would help drive acceptance and use of these systems.

Overall:

- There are systems and methodologies available to ensure a robust system can be created, which complies with international best practice. However, systems such as this are not yet endorsed by SBTi or GHG Protocol but are currently under review.
- We believe there is sufficient demand for certificates to justify a system, and there is enough supply capacity to demonstrate proof of concept. However, additional supply (and demand) would likely be needed to create a self-funding system and enable profitable operation of a registry.
- It appears there is a discrepancy between what organisations are willing to pay, and what trucking companies need to be paid to fully offset the cost of the vehicles. However, TCOs vary widely depending on operational considerations and splitting the costs across beneficiaries would help mitigate pricing issues.

The next step in the project is the release of an RFI to potential registry partners to ascertain interest and ability to create the system, while adhering to the rules and requirements that have been stipulated in this report. A key outcome of this will be an indication of upfront and ongoing costs for a registry, and the ability to maintain pricing at a level to allow many relatively small assets/organisations to be included.

Ongoing discussions and investigations are being undertaken regarding who the owner of such a system would be (e.g. government, industry bodies, private sector). This is a crucial item to confirm to allow the system to progress.

1. Background

This report summarises the findings of the detailed feasibility study into the Low Emissions Freight Certificate system, which aims to speed up the decarbonisation of the heavy road freight sector in New Zealand. The study included input, assistance and support from a range of invested parties, which has been essential to ensure it would be usable, applicable, and functional for the New Zealand freighting marketplace.

This study expands on initial work undertaken on the system, a summary of which has published by the SBC¹. The system would be a Book and Claim system – these are designed to de-couple specific attributes from the physical product, such as reduced GHG emissions, and transfer them separately to another party via a dedicated registry. Book and Claim fits within the wider Market Based Measures category, which aim to use the market and access methodologies to enable decarbonisation.

For these systems to operate legitimately, stringent controls and rules are required, and these are outlined throughout this report. An integral part of the system is a registry to hold, certify, allocate and retire the certificates.

This work has been performed as part of a collaborative effort, with the following specific groups:

- Framework Group – a team of organisations who have provided financial support and industry views regarding how the system should operate and pertinent inclusions and exclusions for various aspects.
- Steering Group – a team of industry experts who have helped to direct and develop the project, while offering guidance regarding sensitive issues.
- Contributing Specialists – various organisations who have provided their time and expertise to offer advice and guidance to help develop a robust, compliant and effective system.

1.1 System purpose

There are two key purposes for the LEFC system:

- Allowing freight operators to monetise the implementation of low carbon vehicles, thus helping to cover the costs of these more expensive assets.
- Allowing freight receivers to easily reduce their gross Scope 3 freight carbon emissions via a market-based accounting approach and have this recognised by international GHG reporting frameworks.

These two points would help to expand the low-carbon freight sector in New Zealand, increasing the speed of the overall decarbonisation of the network.

¹ [Renewable Freight Certificate Assessment | SBC](#)

1.2 Gross vs net emissions totals

When considering carbon emissions, there are two commonly discussed totals:

- Gross emissions refer to the amount of emissions from human activities, such as combustion of diesel in internal combustion engines.
- Net emissions include the removal of emissions from the atmosphere through activities such as planting of trees.

Utilisation of LEFCs would result in gross emissions reductions for a generating organisation as the implementation of low emission vehicles reduces the amount of emissions entering the atmosphere under a market-based accounting approach. This makes the certificates different to purchasing carbon credits, as credits are typically generated through implementation of removal activities (such as planting trees).

Many targeting organisations (such as SBTi) have gross emission reduction requirements, thus the LEFC system offers a significant benefit over the purchasing of a carbon credit, which provide a net emissions reduction via offsets. While Market Based Measures are not yet endorsed by the GHG Protocol, existing frameworks already outline how Scope 1 and Scope 3 emissions are linked and that a reduction in Scope 1 emissions for an organisation will be reflected by a reduction in Scope 3 emissions for another.

1.3 Global context

Market-based measures are a relatively new decarbonisation methodology, but to date have much support. There are a range of these systems operating around the world, primarily for liquid fuels (i.e. sustainable aviation and maritime fuels) and Scope 2 emissions (i.e. electricity).

A range of methodologies and frameworks (such as those by the Smart Freight Centre²) have been developed to adhere to best practice and international carbon accounting processes and standards, such as those outlined by the Greenhouse Gas Protocol³.

While SBTi and the GHG Protocol do not currently recognise Scope 3 Book and Claim systems, they are in the process of reviewing their standards^{4,5} regarding the inclusion of these, and we believe it is likely that they would approve the use of market-based measures in their target setting. Once this occurs, it would help to drive demand and normalise the use of such systems.

1.4 Existing registries

There are a range of similar systems and registries operating around the world, including:

- Renewable Electricity Certificates in New Zealand – operated by BraveTrace⁶.
- Renewable Gas Certificates in New Zealand – operated by BraveTrace⁷.

² [SFC MBM Framework](#)

³ [Scope 3 Calculation Guidance | GHG Protocol](#)

⁴ [SBTi Corporate Net-Zero Standard V2 | Science Based Targets Initiative](#)

⁵ [Scope 3 Proposals Summary | GHG Protocol](#)

⁶ [Renewable Electricity | BraveTrace](#)

⁷ [Renewable Gas Certification System | BraveTrace](#)

- Various liquid fuel book and claim systems (including Renewable Diesel, marine fuels and Sustainable Aviation Fuel) around the world – operated by companies such as RSB, 123carbon, Katalist, SkyNRG, GoodShipping, ShipZero.

While there is a lack of detailed publicly information around these systems, there are some key themes which are evident:

- All the systems are built on a robust set of rules and are compliant with base carbon accounting rules and principles.
- Greenwashing is a major concern, so sufficient data, information, and auditing is required to help alleviate these concerns.
- The cost structures of these vary, but typically generators of certificates are large organisations with relatively few assets (e.g. power stations, oil refineries).

LEFC would follow the same principles, but it is likely the cost structure would need to vary given there would be a large number of assets (trucks) when compared to the REC or SAF examples (where power stations or refineries would be classified as an asset) i.e. entry and ongoing costs for the assets would need to be lower.

1.5 Competition

There are currently no direct competitors to a system such as this in New Zealand. However:

- **Doing nothing** is currently the default which would stop uptake of the system. It is designed to reduce gross Scope 3 emissions for participants, and without a drive for organisations to reduce these emissions, uptake would be limited. However, Scope 3 reductions are increasingly being targeted and seen as essential to reduce global warming, which would aid uptake, and we anticipate that GHG Protocol and SBTi will incorporate these measures into their frameworks.
- **Direct decarbonisation** is a viable option for a range of organisations. This sees a freight provider decarbonise the asset which supplies freight services to an organisation who wants to reduce their Scope 3 emissions. Where direct decarbonisation is possible, this may well be seen as the most desirable option in order to reduce compliance costs.
- **Other low carbon modes** can be used for freight. Rail and shipping have a long history of providing sustainable transport and are a viable solution to reduce emissions. However, these modes are not suitable for all of the freight tasks in NZ, and we believe utilising these modes in conjunction with the LEFC would provide for a complimentary system.

With a market the size of New Zealand, we believe that only one system would have sufficient demand to be feasible. At the time of writing, we are not aware of any other systems under investigation or development.

1.6 Development timelines

Registry development timelines were discussed with potential registry providers. In general, these were relatively short with an expected development time of less than six months.

However, there are overarching considerations which need to be confirmed development:

- Who would “own” the framework specifics of this system, such as naming/detailed rules?
- If a registry provider “owned” the framework specifics, how could the integrity of this works findings be maintained?
- Who would fund the development of the registry, should funding be required?

Additional work is ongoing around the framework ownership and potential entity structures, which would drive the overall time to implementation.

1.7 Required marketing approach

From this study we have identified some key drivers and barriers to the uptake of LEFCs, and a specific marketing campaign would be required to help communicate the benefits. Items to cover would include:

- The LEFC system is designed to comply with international frameworks and target setting organisations. As such, using LEFCs would result in emissions reductions which are able to be accounted for against targets. Note that SBTi and GHG Protocol are currently reviewing the inclusion of reduction methods such as this, and it is believed that they will be included in the near future.
- With the design and compliance of the system, there are a range of rules to alleviate concerns of greenwashing, such as those around additionality, double counting and multiple claims. Transparency of the system would be crucial to help with this alleviation.
- With the design of the system, and assuming acceptance by SBTi and GHG Protocol, it would be able to provide Gross emissions reductions for Scope 3 freight emissions via a market-based accounting approach.⁸ For many organisations, this would provide a significant benefit over carbon credits, which only provide for Net reductions.
- With the nature of the system and the freight networks, there can be multiple beneficiaries for a single claim. While there would only ever be a single Scope 1 reduction, this can result in multiple Scope 3 reductions across different parts of the supply chain (e.g. a freight sender vs a freight receiver are both subject to the Scope 3 emissions, one downstream, one upstream) – this allows the cost of the benefits to be spread, thus making it more affordable for participants. However, there are safeguards in place (as per Section 3.6) to limit the possibility of double counting of emissions reductions.
- While certificates can add a material amount to the cost of operating a vehicle, and therefore overall freight costs, the cost of certificates is likely to be immaterial (in many circumstances) to the end consumer when compared to a range of end products.

As a key action of project implementation, a formal marketing strategy should be developed to facilitate the rollout of the system.

⁸ There is currently no generally accepted carbon accounting methodology specifically applicable to LEFCs (or other scope 3 Book and Claim systems). This is currently being developed.

2. System Description

2.1 General outline

The LEFC system would allow certificates to be generated by low carbon freight assets, which can then be sold to freight users. The two key outcomes of this are:

- Money generated through the sale of the certificates would be used to help fund additional low carbon freight vehicles for freight providers.
- Certificate purchasers can reduce their Scope 3 freight carbon emissions and have this recognised by international GHG reporting frameworks.

In essence, the system separates the physical and environmental attributes of the low emissions vehicle and allows an organisation to purchase the environmental attributes, even though they are not physically connected to the low emissions vehicle.

It is important to note that this system results in gross emissions reductions, not net emissions reductions (offsets). These emissions reductions come from being able to apply the emissions profile of the LEV in place of the standard vehicle used. These emissions are applied in terms of kgCO_2/tkm and tkm, not in terms of carbon saved.

Figure 1 graphically represents how the system would work.

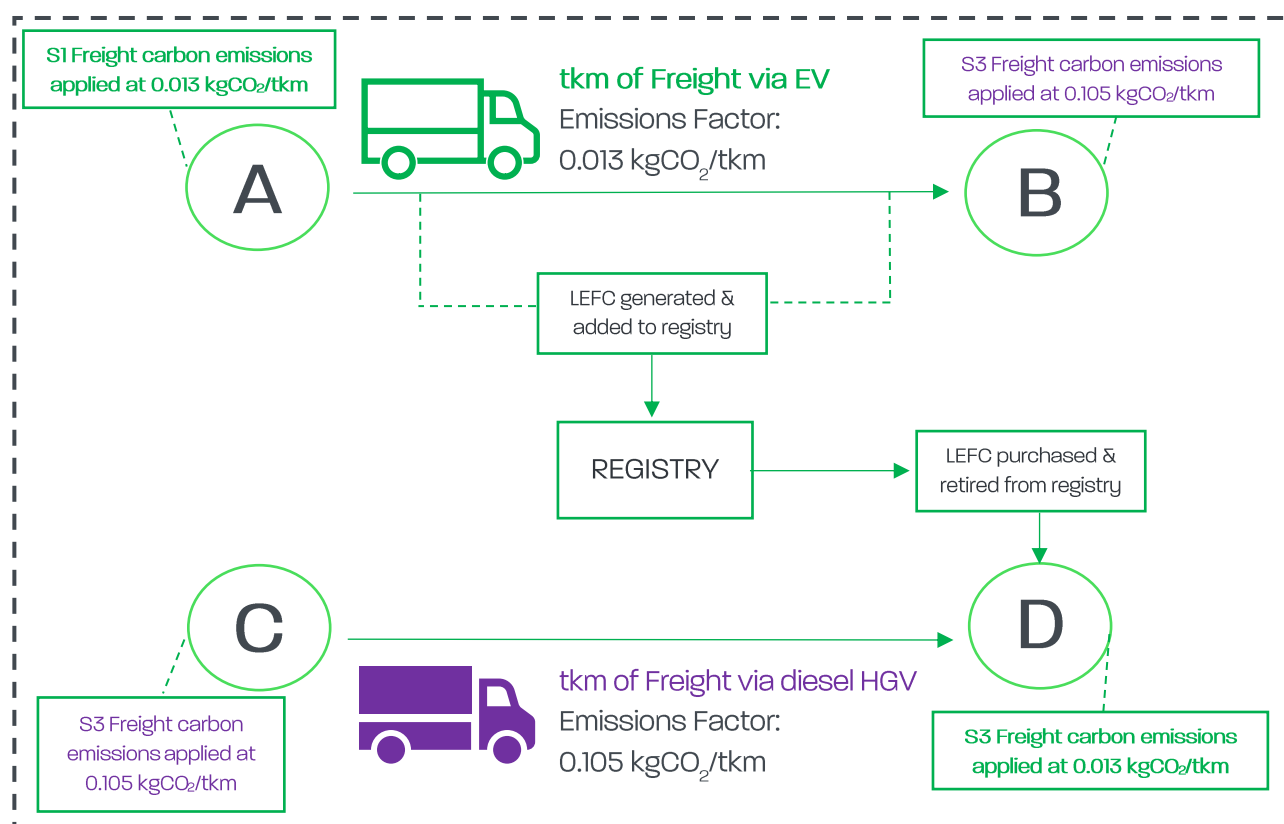


Figure 1: LEFC Graphic

There are a few key points to note on the graphic above:

- Once the EV travelling between (A) and (B) is registered as an LEFC asset, the freight receiver (B) cannot take the EV emissions profile (unless they were to purchase LEFCs).
- The truck owner (A) sees the EV benefit on their Scope 1 emissions.
- The LEFC purchaser (D) can apply the EV emissions profile to their freight, providing an effective Scope 3 reduction.
- Depending on the contractual and operational arrangements, (C) could potentially also claim the EV emissions profile because they are in a different place in the supply chain and are subject to the same Scope 3 emissions as (D) for the movement of the specific items of freight. Further information is provided in Section 3.6 (including Figure 3).

2.2 Pricing methodology

While this report discusses pricing in terms of Marginal Abatement Cost (\$/tCO₂), certificates would be priced in terms of freight delivered i.e. tonne-km. This is because the system is not directly specifying carbon savings, it is taking the environmental attributes from an asset and applying it somewhere else. These attributes are calculated as kgCO₂e/tkm; therefore, this is what they are sold as. A larger purchase of certificates would see more tkm applied.

Given the above, a certificate would have a \$/tkm price listed, and the total cost would vary depending on how many tkm are purchased. It is expected that the lower the kgCO₂/tkm figure is for the certificate, the higher the price would be as this correlates to a larger reduction in carbon. As such, the more carbon efficient the vehicle is, the higher the price of the certificates should be.

In line with the pricing methodology, an organisation would only ever be able to apply certificates up to the maximum of their tkm of freight. They cannot over purchase in order to claim additional carbon savings.

2.3 Applicable use cases

Figure 1 outlines one possible scenario of the system operation, and there are other potential arrangements, such as:

- (B) purchasing some LEFCs and claiming the LEV benefits.
- (C) purchasing the LEFCs on behalf of (D) and they both claiming the benefits.

Table 1 and Figure 2 show a range of scenarios where certificates are suitable whether the goals of providers and receivers align or not.

Table 1: Certificate Use Case Scenario

Scenario	Freight Provider	Freight Receiver 1	Freight Receiver 2 (i.e. split load)	Result
1	Wants to, and can, decarbonise	Wants to decarbonise	N/A	LEFC can be used, but direct decarbonisation options also available and these would likely be easier and lower cost.
2	Wants to, and can, decarbonise	Does not want to decarbonise	N/A	Freight provider can generate LEFC for sale via the registry
3	Wants to, and can, decarbonise	Wants to decarbonise	Does not want to decarbonise	Freight provider can generate LEFC for sale via the registry. These can be purchased by Freight Receiver 1, or others, as desired
4	Does not want to, or can't, decarbonise	Wants to decarbonise	N/A	Freight Receiver 1 can buy LEFC from the registry
5	Does not want to, or can't, decarbonise	Wants to decarbonise	Does not want to decarbonise	Freight Receiver 1 can buy LEFC from the registry

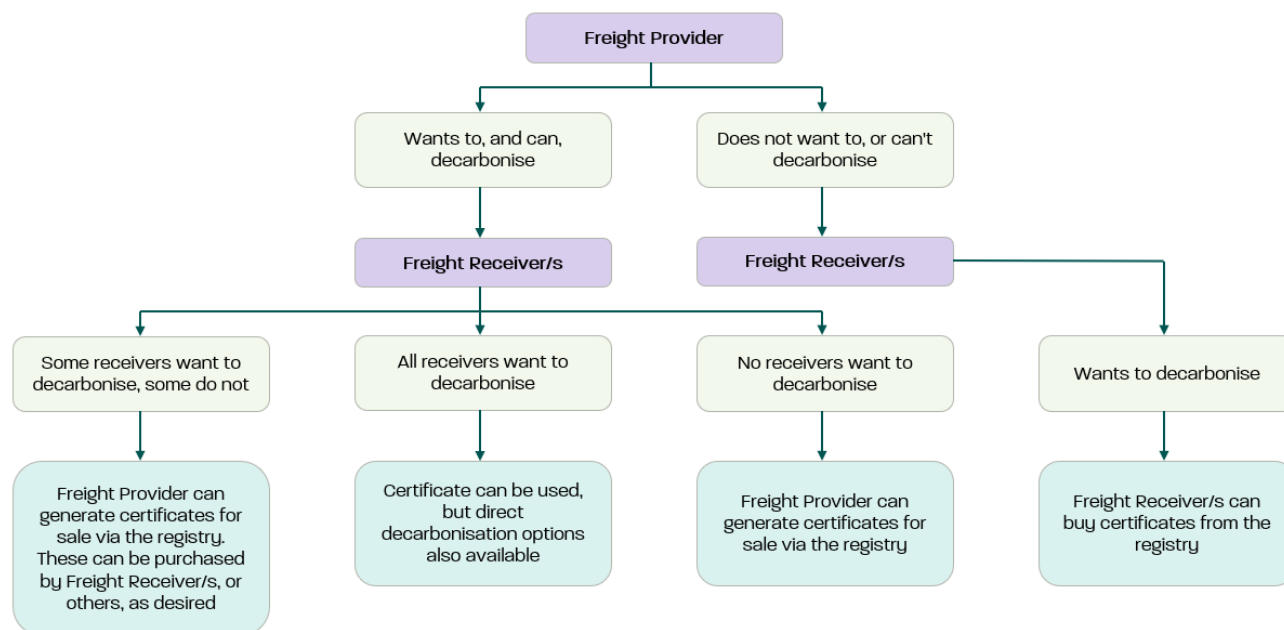


Figure 2: Certificate Use Case Scenarios

3. System Details

3.1 Key requirements

Table 2 summarises the key requirements of the LEFC system, as determined through the various stages of this study in conjunction with literature review, input from the framework group and discussions with other, expert parties. Where further information is required, this is included in subsequent sections – applicable items are highlighted with an asterisk (*).

Table 2: System Specifics

Framework Item	Requirement
Programme Naming	Low Emission Freight Certificate (LEFC).
Base Participant Requirements	To generate certificates, the organisation must measure and report emissions annually in accordance with the GHG Protocol and publicly disclose decarbonisation plans or targets. The generator must also disclose that they are participating in the system, the volume of LEFCs sold and the funding received. There are no requirements for an organisation wanting to purchase certificates.
Who can purchase certificates?	There would be no prerequisites required for an organisation to purchase certificates. However, it would be up to the generator to decide who can purchase their certificates, i.e. kept within their own customer pool, extend outside their customer pool to a specific organisation or release the certificates to the open market.
Vehicle and Fuel Types*	Inclusions: • Battery Electric Vehicles (BEV) • Fuel Cell Electric Vehicles (FCEV) • Dual-fuelled (primarily diesel/hydrogen) • Biofuels / Renewable Fuels To be included, the asset must utilise an external non-fossil fuel energy source.
Certificate Threshold	Maximum of 0.08 kgCO ₂ e/tkm – certificates must have a lower emissions intensity than this to be included in the system.
Calculation methodologies*	Calculations should follow the GLEC framework and must be done over a 12-month period, but multiple measurements can be done over the course of the year (i.e. 4 x 3-month measurements) Measurement of tkm for generation/use of certificates would follow the GLEC framework. Actual weight and distance measurements should be used where possible, however approved calculation/estimation methodologies can be used where actual measurements are not possible or viable.
Certificate Disclosures	Transparency is required regarding the role of certificates in emission disclosures, and participants must dual report Scope 3 freight emissions with both location based and market-based factors. While there is currently no generally accepted carbon accounting methodology specifically applicable to LEFCs (or other scope 3 Book and Claim systems), this is currently being developed by SBTi and GHG Protocol and is expected to be ratified in the near future, although this is still to be confirmed. It is assumed that the Scope 3 systems would be based on Scope 2 reporting requirements from the GHG protocol ⁹ .
Revenue Spending and Additionality*	Certificate generators are encouraged to use funds for decarbonisation initiatives. There would be a requirement to disclose what the funds would be used for on the certificate, rather than enforcement of spending a particular way. However, there would be two tiers of certificates to reflect the age of a generating asset – assets already in place before the system initiation would have different rules to assets purchased after the system is setup.

⁹ [Scope 2 Guidance | GHG Protocol](#)

Certificate Sizing	Traded directly in units of 1 x tonne kilometre (tkm). Certificates would specify cost, tkm, and respective emission factors.
Mode/Operational Alignment*	Freight categories would be listed on the generation certificate, but the certificate use is not limited to that category. Categories may be added as the system progresses, if deemed necessary and viable.
Vintage Constraint	Data collection for certificate generation for an asset is measured over 12-months, with certificate generation at least once a year. Generating assets must be less than 10 years old to participate in the system. Once generated, the certificates can be applied to a subsequent freight task.
Asset Durability	A generating asset may generate certificates for up to 10 years once registered in the LEFC registry. However, if the carbon threshold is modified following an annual review, and the asset no longer meets participation thresholds, the asset must exit the LEFC programme within 5 years following any rule changes.
Exclusivity	Each generating asset must only be registered to a single registry. If attributes of an asset are applied to other low carbon offerings (formal or informal) or carbon credit project, it cannot be included in the programme.
Double Counting*	Prevention of double counting is essential for this system and international best practice should be followed to ensure this. Note that there can be multiple beneficiaries at different stages in the supply chain, and as long as this is treated correctly it is not double counting (outlined in Section 3.6).
Audit Requirements*	All generating assets and associated certificates would be reviewed and audited annually. Non-compliance may result in penalties such as removal from the system.
Participant Compliance and Penalties*	Participants must comply with all current system requirements set as well as any future requirements as the system progresses and matures. Participants that do not comply with requirements would face consequences that may include, but are not limited to, certificate cancellation, penalty payments, suspension or removal from the registry.
Registry*	A registry must be created to record the creation, issuance, transfer and retirement of a certificate and ensure double counting does not occur. The registry should be certified by an external body to ensure adherence to the required rules and regulations, such as International Sustainability and Carbon Certification or RSB.
System Transparency	The system rules, operations and effects are to be transparent to participants and the public. Standards, calculation methodologies and rules should be publicly available.

* Further information provided in subsequent sections

3.2 Vehicle/fuel types

There are a range of low carbon technologies that would be included in this system. Each fuel/vehicle type would have different calculation methodologies required in order to adequately address their emissions, but these would need to follow the same principles. To be included in the system, the vehicles must use an externally provided energy source which is not a fossil fuel and provide an emissions intensity of less than 0.08 kgCO₂/tkm (to be reviewed annually) – this allows for the inclusion of such technologies as BEV and dual-fuelled hydrogen, but not standard hybrid vehicles. Note that biofuel availability in New Zealand is very limited and lack of supply may mean they do not make a meaningful contribution as part of this system.

In order for individual assets to be included, the emissions values of the vehicles would need to be calculated and audited as part of the data entry into the registry. Specific items for fuel/energy carbon emissions for each vehicle type are described below and align with the methodologies outlined in the GLEC Framework¹⁰, an internationally recognised, lead practice emissions accounting standard for freight.

¹⁰ [Global Logistics Emissions Council Framework | Smart Freight Centre](#)

Battery Electric Vehicles (BEV)

- In general, the electricity emissions factor for BEV charging is defaulted to the grid average for that year. In order to use zero emission renewable electricity (via RECs or direct renewables) certificate generators must record the charging location of their EV trucks and what they are using to charge the BEV (to be certified via invoices or retailer summaries).

Fuel Cell Electric Vehicles (FCEV)

- Generators must record the refilling location, as well as certification of emissions for producing the hydrogen. For example, hydrogen can be generated with electricity purchased that meets market-based definitions under current (and emerging) GHG Protocol Scope 2 guidance, such as PPAs, RECs, and other contractual instruments that transfer the renewable attribute of the generated electricity. Alternatively, invoices from a hydrogen provider could be utilised to provide additional information.

Dual-fuelled Vehicles

- A generating asset must incorporate an externally provided fuel source that is not diesel (e.g. hydrogen).
- Generators must record the refilling location of hydrogen and whether grid or contractually procured renewable electricity is used to generate hydrogen.
- Diesel use is required to be recorded over the same recording period as the above.
- Operators would not be able to switch between the different fuels for specific clients if participating in the system. However, they can sell certificates to particular clients.

Biofuel / Renewable Fuels

- Generators must record the biofuel or renewable fuel blend, along with diesel purchases.
- Certification of the feedstock type is also required. This involves the supplier providing emissions associated with processing of the fuel and transport to the generator.

3.3 Calculation methodologies

In line with above, the GLEC standard outlines calculation methodologies for emissions of vehicles. Note that where possible, Primary Data (direct measurements) should be used. Where these are not possible, modelled/calculated data should be used, with default values used as a last resort.

Calculations must be done over a 12-month period to factor in all seasonal variations, backhauling and empty running. Multiple measurements can be done over the course of the year (i.e. 4 x 3-month measurements) to keep up with demand, however a measurement over a full contiguous 12-month period must be recorded and externally audited to ensure credibility.

3.3.1 Weight

Where possible, actual weight measurements should be used. These weights should include the product and packaging, but not include external infrastructure such as containers used specifically for the transport operation, in alignment with the GLEC framework. Where actual weights are not known, calculation/estimation methodologies should be recorded and conveyed for external verification, as required.

3.3.2 Distance

Where possible, telematics should be used to measure distance. Where telematics are not installed or viable, route planning and corresponding odometer readings should be recorded and conveyed for external verification, as required.

3.3.3 Certificate generation

To establish baseline emissions values for the freight receiver/certificate purchaser (in terms of kgCO₂/tkm), emissions need to be calculated for the actual delivery of goods as part of a Scope 3 dual reporting framework once it's released by the GHG Protocol. This is expected to be similar to Scope 2 dual reporting¹¹.

The calculations should be as high on the accuracy hierarchy as possible:

- 1) The freight provider measures the actual emissions associated with the tkm of freight moved – actual weight measurements and telematics for distance measurements.
- 2) Where the freighter cannot provide this through measured data, then the freighter or the freight receiver can model the weight measurements based on known parameters and correlate this with distance travelled at each weight. Telematics or route planning and odometer readings are required for distance measurements.
- 3) Where neither of the above is known in terms of weight measurements, then default factors could be used for weight measurements, such as those provided by the GLEC framework. Weight measurements must be correlated with distance measurements. Telematics or route planning and odometer readings are required for distance measurements.

We anticipate that the hierarchy would affect the price of the certificate, with certificates with actual measurements priced higher. Estimations based on known parameters or default methods should be conservative to incentivise moving up the accuracy hierarchy. The methodology associated with generating the certificate would be disclosed on the certificate itself.

Generating assets would be reviewed and audited annually to ensure the methodologies are aligned with those described in the GLEC framework. Non-compliance may result in penalties such as removal from the system.

3.4 Revenue spending & additionality

Certificate generators are encouraged to use funds for decarbonisation initiatives. There would be a requirement to disclose what the funds would be used for on the certificate, rather than enforcement of spending a particular way, and how this funding has enabled emissions savings beyond a BAU scenario. However, if (during auditing) it is found that the certificate revenue is being used for other purposes than that disclosed on the certificate, then penalties (per Section 3.8) may apply.

¹¹ [Scope 2 Guidance | GHG Protocol](#)

Greenwashing is a major concern with the operation of the LEFC system. However, while the system is designed to enable additionality, it is unlikely that it can get to a place of true additionality without significant restrictions on generating assets and revenue use. The fewer restrictions on revenue application, the higher the greenwashing risk and the lower the credibility of the scheme. We believe that ringfencing of assets is the best possible option to reduce greenwashing risks, whilst still allowing existing assets into the scheme. This will have trade-offs in terms of attractiveness to generators and degree of payoff for existing assets.

To enable existing assets to enter the scheme but recognise the desirability of additionality, there would be two tiers of certificates to reflect assets that are purchased before or after the LEFC system is in place:

- **Tier 1 – New Assets:** LEVs that are purchased AFTER the LEFC registry begins operating. Revenue generated from certificates CAN be used to recoup the costs of these assets.
- **Tier 2 – Old Asset:** Low emissions vehicles that are purchased BEFORE the LEFC registry begins operating. Revenue generated from certificates CANNOT be used to recoup the costs of these assets, rather it needs to be put to additional (new) decarbonisation assets.

An extension of this is where funds from a Tier 2 Asset are used to fund a new asset, which is then to be included in the system. In this case, the new asset would also be classified as a Tier 2 asset (and have the same funding restrictions) because its additional cost has already been covered as part of the original asset operation.

As the pricing is market driven, if the market values the difference between Tier 1 and Tier 2 assets, there may be a different price for certificates generated by each class. If the market does not value the difference, then we expect pricing would be similar.

3.5 Mode/operational alignment

The GLEC emissions calculation methodologies have a range of recommendations in order to increase accuracy, including categorising transport into:

- Freight type (such as bulk, containerised etc).
- Temperature condition (such as ambient, chilled etc).
- Journey type (such as long haul, last mile etc).
- Contract type (such as shared or dedicated services).

While this is something that should be strived to attain, in a fledgling system there would be insufficient diversity in certificate generation to enable this widespread categorisation. Requiring this diversity would negatively impact the uptake of the system to a greater degree than any reduced emissions accuracy. Further, the Smart Freight Centre's framework methodologies for calculating certificates do not go to this level of detail.

As such, there would be a requirement for the freight category to be listed on the generation certificate, but the certificate use is not limited to that category. As the system progresses, connecting like-freight categories could be implemented, if deemed necessary and viable. This would be reviewed each year as part of the annual framework review.

3.6 Double counting

There are additional considerations to ensure there is no double counting of emissions:

- If an asset is generating certificates, the Generator cannot assign their “low emissions” attributes to direct routes for specific clients or customers. Note that a generator can have low emissions assets which are generating LEFCs, and others that are doing direct decarbonisation, but a single asset cannot do both.
- If a certificate generates revenue that is to be split across two or more beneficiaries (as per below), this must be specified on the certificate. If a beneficiary is not disclosed on the certificate, they cannot receive the low carbon benefits i.e. certificates cannot be on-sold.
- An accounting review must be conducted on all generators to ensure that their total tonnes and kilometres match what is disclosed on their certificates. Penalties may be given to generators that do not align.

It should be noted that with the carbon emissions of certificates being able to be applied across different parts of the value chain, multiple organisations can realise the benefits of the certificates, and this is not classified as double counting. An example of this would be:

- A trucking company would see reduced Scope 1 emissions due to the use of a low emission vehicle.
- The organisation sending the freight the certificate is purchased for would see reduced downstream Scope 3 emissions.
- The organisation receiving the freight the certificate is purchased for would see reduced upstream Scope 3 emissions.

Figure 3 is an excerpt from the GHG Protocol Scope 3 FAQ document and outlines how a single transportation task results in Scope 3 emissions for two distinct organisations, as per the above.

Figure [9.1] Type of double counting within scope 3

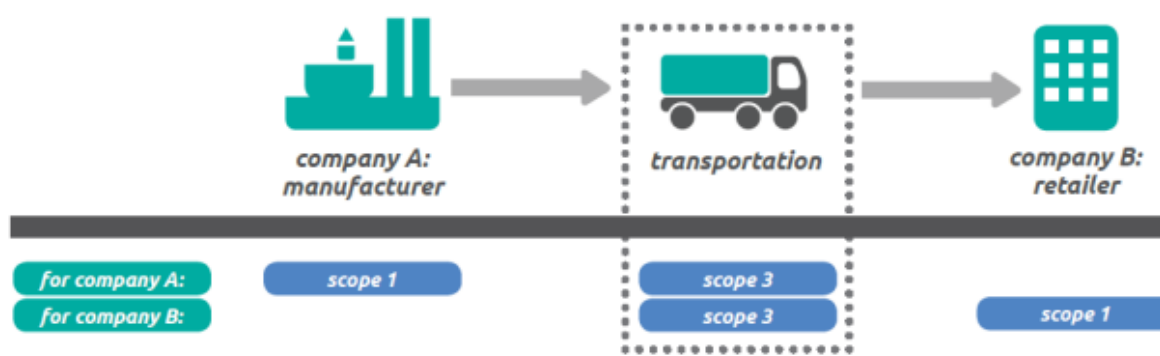


Figure 3: Multiple Scope 3 claims¹²

This approach is supported by the Smart Freight Centre in their Book and Claim best practice document¹³ and has been discussed with an international registry company.

¹² [Scope 3 Detailed FAQ | GHG Protocol](#)

¹³ [Principles and Best Practices | Book and Claims Community](#)

3.7 Participant audit requirements

As mentioned in previous sections, all generating assets and associated certificates would be reviewed and audited annually to ensure:

- Calculation methodologies are aligned with those described in the GLEC framework.
- Total tonnes and kilometres match what is disclosed on their certificates.
- Environmental attributes of assets are not accounted for elsewhere.
- Generators are complying with their disclosed use of funds for decarbonisation activities.
- General rules and requirements are being adhered to.

Non-compliance may result in penalties such as removal from the system and given the use of certificates in external reporting for purchasers, timely completion of audits will be crucial.

3.8 Participant compliance and penalties

Participants must comply with all current system requirements set out in Section 3.1, as well as any future requirements as the system progresses and matures. Participants that do not comply with requirements would face consequences that may include, but are not limited to, certificate cancellation, penalty payments, suspension or removal from the registry, having to correct carbon reports and notifying affected third parties.

Further, generators may face specific penalties if they do not comply with their disclosed use of funds for decarbonisation activities. Where certificates have already been sold/used, there may be cancellations of other certificates held by the generator, or a requirement for the generator to make up revenue spending on disclosed activities.

3.9 Registry compliance and audit

There are a range of key documents, standards and guidelines that need to be complied with to ensure a robust, effective and auditable system. These include:

- [Book and Claim Principles and Best Practices | Book and Claim Community](#)
- [Market Based Measures Accounting Framework | Smart Freight Centre](#)
- [Global Logistics Emissions Council Framework | Smart Freight Centre](#)
- [MBM Specification | Smart Freight Centre](#)

These reference a range of other standards, which should be complied with as appropriate:

- [ISEAL Codes of Good Practice | ISEAL Alliance](#)
- [ISO 22095:2020 - Chain of custody - General terminology and models | ISO](#)

The principles and rules from these documents have been applied to the system design, but if/when a registry is created, it is essential these rules are reviewed and adhered to – additional rules and guidance documents are currently being considered also, and these would need to be incorporated as applicable. Further, the registry should undergo a detailed design phase which should provide additional commentary and information regarding:

- The operation and administration of the certificates and scheme to help ensure compliance.

- The controls of the system to ensure unique, traceable and retireable certificates.
- The controls to ensure LEFC assets only operate on the LEFC system, and the environmental attributes of these assets are not used elsewhere.
- Penalties for non-compliance.

The Voluntary MBM document from the Smart Freight Centre includes a range of decarbonisation examples, including one targeting electrification of road freight. The principles of this example are included in the LEFC system, but these are relatively brief and there are a wider range of rules and guidelines being applied.

Prior to the initiation of the system, the registry should undergo an audit process from a reputable auditing body, such as RSB or Toitu. Given that the system would be operating in NZ, preference would be given to a local auditor. Audit topics would include (but would not be limited to):

- General system operation.
- Transaction tracing from start to finish.
- Compliance with key standards.
- Consideration of additionality, double counting and greenwashing rules and mitigants.
- Controls of the system to ensure unique, traceable and retireable certificates.

4. Demand Study

Sufficient supply and demand of Low Emissions Freight Certificates (LEFCs) is essential for the success of the system, and assessing these factors is crucial. While the participants in the project recognise the likely benefits of the system, additional review was needed to gain an understanding of:

- The price of certificates required to incentivise freight providers to participate.
- The likelihood of freight receivers purchasing certificates.
- The price freight receivers are willing to pay.
- The overall supply and demand picture.

Background technical research was undertaken, and a range of discussions have been had with participating companies, clients of participating companies and other organisations. The detail of these items can be found in a separate report, but a summary is included below for completeness.

4.1 Supply pricing

The Ara Ake Heavy Freight Total Cost of Ownership Tool¹⁴ was used to compare the total cost of ownership (TCO) per tonne-kilometre of moving heavy freight in New Zealand and estimate the cost of carbon abatement for various vehicles/fuels. The default scenario for large heavy goods vehicles (HGV) was used for comparison with slight changes to key assumptions. These assumptions can be found in the LEFC Demand Report, with default scenario assumptions detailed on the Ara Ake tool [here](#). Note that these costs are designed to reflect the total costs that operators of the vehicles see (including capital purchases).

Further, the National Road Carriers have recently released a TCO calculation tool in association with EECA which could also be used to help calculate numbers¹⁵.

These figures are designed to be indicative only. The specific operational profiles of different organisations, different vehicle makes/models and charging/fuelling considerations will result in variations to the figures below, and organisations should perform their own calculations to determine the TCO and abatement cost of a low emissions vehicle in their own organisation and with their particular operational inputs.

Figure 4 illustrates the carbon abatement cost for each vehicle/fuel type assuming the large heavy goods vehicle scenario and 5 years of ownership. The BEV delivered cost of energy is based on current ChargeNet public charging prices¹⁶ (excluding GST) and therefore includes infrastructure and network costs. These are estimates only, with energy rates, locations and existing/future infrastructure requirements all having a significant impact on the rates. As above, businesses should perform their own independent calculations to determine the economics and practicality of a low emissions vehicle in their business operations.

¹⁴ [Heavy freight total cost of ownership tool | EECA](#)

¹⁵ [Cost Model | National Road Carriers](#)

¹⁶ [ChargeNet Pricing Update 2025 | ChargeNet](#)

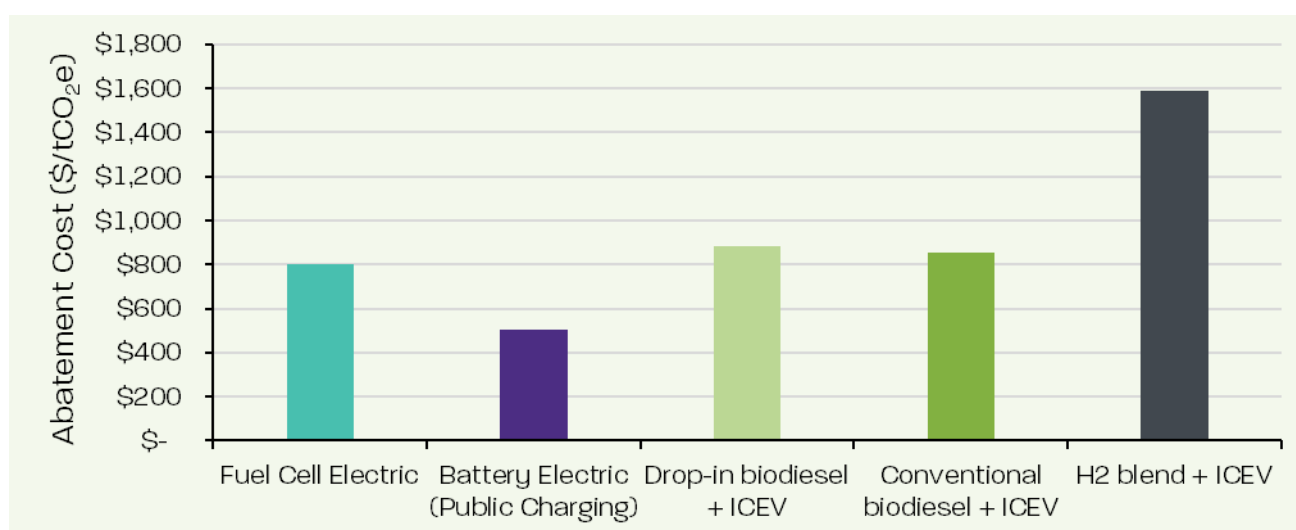


Figure 4: Carbon Abatement Cost Comparison for Vehicle/Fuel Types

Among the options:

- Hydrogen blended with diesel in ICE vehicles (H₂ blend + ICEV) is the most expensive to abate freight emissions, reaching up to \$1,600/tCO₂e with a TCO of ~\$0.12/tkm.
- Green hydrogen combined with fuel cell vehicles (FCEV) is cheaper than the hydrogen blend alternative or biodiesel options at ~\$800/tCO₂e, but a higher TCO of \$0.135/tkm.
- Battery electric vehicles (BEV) are generally the lowest-cost solution, at \$500/tCO₂e and a TCO of \$0.13/tkm (with a fully inclusive charge rate of 80 c/kWh).
- Biodiesel options (drop-in and conventional) fall in the mid-range, generally costing \$800-\$900 per tonne of abatement, with TCOs of \$0.129/tkm and \$0.099/tkm for drop-in and conventional biodiesel, respectively. It should be noted that existing conventional biodiesel supplies are limited and drop in biodiesel supplies are not available in the country.

As above, the numbers included here will not be indicative of every operational scenario. An example of this is for BEV operation, where the effective charge rates will vary based on public vs private charging, site infrastructure requirement, number of vehicles using the infrastructure, charging regimes, electricity and network rates. Further, there are a variety of purchase options in terms of cost and performance of vehicles, and these will also impact the TCO and MAC.

The battery electric scenario above assumes current ChargeNet prices for BEV charging (~\$0.80/kWh). We anticipate that organisations that purchase and own a number of electric trucks will have a depot setup to perform the charging themselves. In this case, with a well-designed depot, it is likely the charge price would be much less. Current Bus charge depots are achieving charge rates (inclusive of infrastructure) of 35-50 c/kWh, and at 50 c/kWh, the Are Ake modelling suggests a MAC of \$150/tCO₂e.

It should be noted that while depot charging provides a much lower effective charge rate, it can come with considerable setup costs. These vary depending on the existing setup/infrastructure, planned operational regime and location, but costs are likely \$1M-\$2M per MW. However, there will likely be depot charging as-a-service providers established to help mitigate this.

Given the above, it is important that depots are planned and setup correctly – the NZTA has released an advisory document¹⁷ on the electrical supply for Bus charging depots, and this is largely applicable for trucking depots also.

With the LEFC focus on large HGV, the above indicates that **pricing of \$200/tCO₂e to \$600/tCO₂e would be required** to offset the marginal cost of BEV and FCEV decarbonisation options (in some circumstances), however lower rates would still greatly improve the economics of the solutions. Costs could be reduced for individual participants by spreading the certificate cost over the beneficiaries of the reduced emissions. Note that the pricing would ultimately be set by the market and matching supply and demand.

4.2 Demand pricing

Interviews were conducted with a range of organisations to gauge the demand for certificates, and what they would be willing to pay.

There was general support for certificates, but willingness to pay is currently low with limited freight or decarbonisation budgets and current profitability issues overriding environmental concerns. There is growing interest in low-carbon delivery options from end-customers, but this is not yet mainstream and while there would be demand, this is not currently widespread.

However, despite this:

- Most businesses were not currently willing to pay for a system or its benefits.
- 10% of businesses saw a price of ~\$50/tCO₂e fair.
- 10% of businesses were happy to pay a premium of \$85-100/tCO₂e.

Due to there being multiple Scope 3 beneficiaries of a single transaction, it would be possible for each of the parties to contribute a portion of the cost, therefore spreading the burden and further enabling decarbonisation.

4.3 Quantity of certificates

As of 30th April 2025, there are 58 heavy goods vehicles greater than 10,000 t gross vehicle mass (GVM) registered in New Zealand that are either battery electric (55) or fuel cell electric (3). Further, in January 2025, TR Group also confirmed new purchase agreements to bring 20 hydrogen fuel cell electric trucks to New Zealand, with first deliveries expected in 2025¹⁸.

As outlined in the Demand Study, if all these vehicles joined the LEFC system, they would likely generate 74 Mtkm and enable further emission reductions of 9,000 tCO₂e if the income is reinvested in further LEVs.

¹⁷ [NZTA - Electricity Market Guidance](#)

¹⁸ [TR Group lands hydrogen truck supplier deal | NZ Trucking](#)

The current emissions from road transport are approximately 3,500,000 tCO₂e per year¹⁹, coming from ~166,000 HGVs. Assuming the current 75 registered and planned low emissions vehicles can generate certificates, approximately 0.013% of road transport emissions could be moved with certificates. While this is a relatively low percentage it would be sufficient to demonstrate the effectiveness of a system and encourage additional low emission vehicles. Further, with so many vehicles in the country, there is a large amount of system expansion available.

With the tkm figures above, and the pricing from Section 4.1, potential cost transfers equate to:

Certificate Price	Revenue per Vehicle	Total Revenue (75 Vehicles)	Registry Revenue (10% of total)
\$200/tCO ₂ e	\$9,000 - \$63,000	\$1,755,000	\$175,500
\$600/tCO ₂ e	\$29,000 - \$190,000	\$5,395,000	\$539,500

While it is very unlikely that all vehicles would participate in the system, this gives an indication of the potential pool of vehicles currently in New Zealand that could be utilised. We believe there is sufficient vehicle stock in the country to warrant setting up a system and to perform proof of concept.

4.4 Summary

Demand for both the generation and use of Low Emissions Freight Certificates was investigated to inform the price and incentives for freight providers and receivers to participate in the system. The discussions allowed for a general gauge of interest to purchase certificates and what price they may be willing to pay.

It was found that there is significant interest for decarbonisation in the freight space, with growing customer desire for low carbon deliveries. While budgets are tight and many organisations would not be willing to pay for this decarbonisation, ~20% of businesses spoken to indicated an ability and willingness to purchase certificates at between \$50-\$100/tCO₂e.

It was also noted that often businesses prefer direct decarbonisation where it is viable, either in freight or other emissions scopes, as this would provide a clear brand advantage over certificates for reduction.

A review of the TCO of various low carbon transport options outlined that certificate pricing of \$200/tCO₂e - \$600/tCO₂e would be required to offset the marginal cost of key technologies (in this set of circumstances). Further:

- Costs could be reduced for individual participants by spreading costs over the beneficiaries of the reduced emissions. As such, the freight provider, 3PL company and the end customer could all see a much-reduced cost while still gaining all the benefits.
- Given that a range of clients would pay \$50/tCO₂e - \$100/tCO₂e, some technologies could be fully paid for through splitting of costs by beneficiaries.

¹⁹ [Green Freight Strategic Working Paper | Ministry of Transport](#)

- Rates of \$200/tCO₂e - \$600/tCO₂e correlate to \$0.017/tkm - \$0.052/tkm, and this may add 15% - 45% to the cost of vehicle operation, which is a significant increase for the freighting company. However, when compared to the cost of the items freighted, it is anticipated to be a relatively minor cost to the end user.

While there are barriers preventing businesses from adopting more low emissions vehicles for potential certificate generation, such as high capital costs, lower ranges, limited charging/refilling stations, and the additional weight from batteries and fuel cell systems resulting in reduced payloads, there are sufficient low emissions vehicles in the country to provide a base of potential certificate generation in the near term. This would help to provide proof of concept and incentivise further purchases. Additional vehicles would be required in order to fund a self-sustaining certificate system.

Overall, we believe there is sufficient demand for certificates to justify a system, and there is enough supply capacity to demonstrate proof of concept. However, additional supply (and demand) would likely be needed to create a self-funding system and enable profitable operation of a registry.

5. Request for Information (Registry)

Initial investigation has been undertaken into potential registry providers, with discussions occurring with organisations who operate registries for other book and claim systems (these are typically electricity or liquid fuel-based systems).

This investigation and discussions have outlined that there are many potential organisations that could develop the registry, and many different pricing and operational models that could be utilised.

To help narrow the potential partners, an RFI will be prepared and released to the market to identify and confirm:

- Parties interested in developing the registry.
- Timelines of registry development.
- Pricing and charging methodologies for constructing and operating the registry.

Glossary

LEFC	Low Emissions Freight Certificate
EV	Electric Vehicle
BEV	Battery Electric Vehicle
FCEV	Fuel Cell Electric Vehicle
GLEC	Global Logistics Emissions Council
MfE	Ministry for the Environment
SBTi	Science Based Target initiative
rH	Renewable hydrogen
tkm	Tonne Kilometre – Metric for freight movements
Book and Claim	A system that allows organisations to track and claim the environmental benefits of sustainable resources
Market Based Measure	A policy tool that utilises market mechanisms to achieve environmental goals
Generator	Business generating certificates
Purchaser	Business purchasing certificates
Participant	Generator or purchaser of certificates
Generating Asset	Vehicle that is generating certificates
3PL	Third Party Logistics